

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 12 June 2001 (12.06.01)	
International application No. PCT/IB00/01135	Applicant's or agent's file reference Berlin2/PCT
International filing date (day/month/year) 21 August 2000 (21.08.00)	Priority date (day/month/year) 25 August 1999 (25.08.99)
Applicant HOHL, Markus	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 23 March 2001 (23.03.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Pascal Piriou Telephone No.: (41-22) 338.83.38
--	--

PATENT COOPERATION TREATY

PCT

REC'D 12 NOV 2001

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ./.	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB00/01135	International filing date (day/month/year) 21/08/2000	Priority date (day/month/year) 25/08/1999
International Patent Classification (IPC) or national classification and IPC A47B61/00		
Applicant BERLINLONDON LIMITED et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 18 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 23/03/2001	Date of completion of this report 07.11.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Papadimitriou, S Telephone No. +49 89 2399 2760 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB00/01135

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-12 as received on 13/10/2001 with letter of 11/10/2001

Claims, No.:

1-10 as received on 13/10/2001 with letter of 11/10/2001

Drawings, sheets:

1/4-4/4 as received on 13/10/2001 with letter of 11/10/2001

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB00/01135

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-3
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-3
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-3
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item I

Basis of the report

1) Independent claim 4

- 1.1) The amendments filed with the letter dated 11.10.01 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:

The passage in the last two lines of current claim 4 reading: "... and the door (20) **lies snug against** a compartment wall (13) when the door (20) is in the open position" cannot be clearly and unambiguously derived from the originally filed application. Figure 1 in isolation cannot provide basis for such an amendment. For the same reasons the passage at page 4, second paragraph also contravenes Article 34(2)(b) PCT.

- 1.2) Consequently, the scope of protection of claim 4 cannot be unequivocally determined. The subject-matter of claims 4 to 10 has not been considered when drafting the present international preliminary examination report.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) State of the art

Reference is made to the following documents:

D1: US-A-5 135 293

D2: US-A-4 783 132

D3: FR-A-2 481 904

D4: US-A-5 039 179

D5: DE-C-360 666

D6: US-A-5 651 219

2) Independent claim 1

Best prior art: Document D1, directed to a locker assembly 20, including at least "first" 24 and "second" 26 neighbouring lockers, cf. figs. 1 and 2, at least the "first" locker 24 including a body forming a compartment having an open side, cf. fig. 6, and a door 30 of **substantially** uniform cross section and of uniform curvature, cf. fig. 6, this curvature lying upon a circle, cf. fig. 6, the door 30 being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, cf. col. 6, lines 1-10 and fig. 6, there being a cavity between said "first" and "second" lockers, cf. fig. 6, the door's 30 curve **remaining** lying upon the same said circle during rotation, cf. fig. 6, and the cavity being capable of accommodating the door 30 whilst the latter is in the open position.

Objective problem: To further develop the locker assembly of D1 to make more efficient use of the space inside the locker assembly.

Solution: The provision of a locker assembly comprising at least two lockers each formed from compartments walls, wherein the space between neighbouring compartment walls is used to accommodate a door of a locker when in the non-closing position.

Inventive step: In the assembly of D1 there exists no cavity between compartments walls of neighbouring lockers. In D1 the group of lockers is made up of a rigid hollow frame and semi-cylindrical doors.

D2 is not directed to a locker assembly but to a lockable cupboard, primarily intended for a bathroom.

D3 is directed to a single locker comprising slidable curved doors 1,3, cf. fig. 2.

D4 is directed to a locker assembly comprising a semi-cylindrical chamber 1 which accommodates a compartment 2 disposable therein and rotatable relative thereto.

The compartment 2 acts as a door member, but due to the fact that it is housed inside the chamber 1 the space available for housing articles is rather limited.

D5 discloses a locker assembly including a number of semi-cylindrical lockers housed within outer walls a,a, cf. fig. 2.

D6 is more remote as it is directed to an workspace module with curved doors and not to a locker assembly.

Industrial applicability: The claimed assembly is industrially applicable in the field of furniture equipment.

Consequently, the clarity objection raised in section VIII apart, the subject-matter of independent claim 1 complies with the provisions of Article 33, paragraphs (2)(3)(4) PCT.

3) Dependent claims 2 and 3

These dependent claims define various embodiments of the assembly specified in independent claim 1 and also comply with the provisions of Article 33 paragraphs (2)(3)(4) PCT.

Re Item VII

Certain defects in the international application

1) Description

According to the requirements of Rule 11.13(I) reference signs not appearing in the description shall not appear in the drawings, and vice versa. This requirement is not met in view of the reference signs 55, 56 and 57, cf. fig. 4.

Re Item VIII

Certain observations on the international application

1) Independent claim 1

- 1.1) In the claim in lines 6 and 7 at least one locker is specified as including compartment walls, which implies that there can be only one locker including compartment walls. In contrast, in lines 13-15 the cavity is specified as spanning between neighbouring compartment walls of the first and second lockers, which implies that at the least the "first" and "second" lockers must be equipped with

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB00/01135

such compartment walls. Therefore, claim 1 does not comply with Article 6 PCT. The opinion set out in section V was based on the assumption that the latter construction was intended.

- 1.2) The term "generally" (line 8) is vague and indeterminate in scope as one of its interpretations is the term "usually" (Art. 6 PCT). The opinion set out in section V was based on the assumption that the term "substantially" was intended.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference Berlin2/PCT	FOR FURTHER ACTION <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. PCT/IB 00/ 01135	International filing date (day/month/year) 21/08/2000	(Earliest) Priority Date (day/month/year) 25/08/1999
Applicant BERLINLONDON LIMITED et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 00/01135

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 651 219 A (ERIKSSON STEVEN W ET AL) 29 July 1997 (1997-07-29) cited in the application abstract; figures 1,2,7 column 6, last paragraph -column 7, paragraph 1 -----</p>	1,2

INTERNATIONAL SEARCH REPORT

International Application No

CT/IB 00/01135

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A47B61/00 A47B87/00 E06B3/90 E06B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47B E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 783 132 A (BAUS HEINZ G) 8 November 1988 (1988-11-08)	4, 5, 10-12
Y	abstract; figures 1, 7	6, 7
A	column 5, paragraph 2	9
Y	FR 2 481 904 A (DAIGRE JEAN CLAUDE) 13 November 1981 (1981-11-13)	6
Y	US 5 039 179 A (CHOUZENOUX GILBERT) 13 August 1991 (1991-08-13)	7
	cited in the application abstract; figures 1-5 column 2, line 13 - line 36	
A	DE 360 666 C (MAASZ) 23 September 1919 (1919-09-23)	1, 2
	claim 1; figures 1, 2	
	--- -/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

10 November 2000

Date of mailing of the international search report

17/11/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Jones, C

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 00/01135

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4783132	A	08-11-1988	DE 3601614 A AT 66279 T AU 592273 B AU 6789287 A CA 1317627 A DE 3772060 A EP 0230237 A GR 3002719 T ZA 8700360 A	23-07-1987 15-08-1991 04-01-1990 23-07-1987 11-05-1993 19-09-1991 29-07-1987 25-01-1993 30-09-1987
FR 2481904	A	13-11-1981	NONE	
US 5039179	A	13-08-1991	FR 2602410 A AT 74723 T DE 3778371 A DE 3778371 D EP 0315639 A WO 8801143 A JP 7004303 B JP 2500332 T	12-02-1988 15-05-1992 21-05-1992 21-05-1992 17-05-1989 25-02-1988 25-01-1995 08-02-1990
DE 360666	C		NONE	
US 5651219	A	29-07-1997	US 5452547 A US 5687513 A	26-09-1995 18-11-1997

**(19) World Intellectual Property Organization
International Bureau**



(43) International Publication Date
1 March 2001 (01.03.2001)

PCT

(10) International Publication Number
WO 01/13764 A1

(51) International Patent Classification⁷: A47B 61/00,
87/00, E06B 3/90, 5/00

[GB/GB]; BerlinLondon Limited, 1-3 Leonard Street,
London EC2A 4AO (GB).

(21) International Application Number: PCT/IB00/01135

(22) International Filing Date: 21 August 2000 (21.08.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9920014.9 25 August 1999 (25.08.1999) GB

(71) Applicant (for all designated States except US): BERLIN-LONDON LIMITED [GB/GB]; 1-3 Leonard Street, London EC2A 4AQ (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): HOHL, Markus

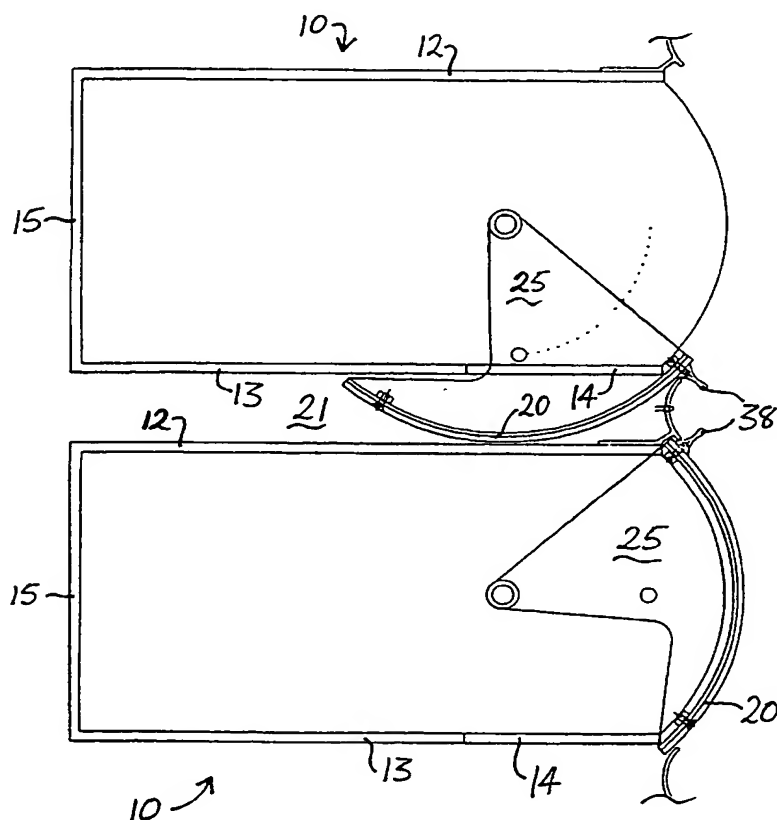
(74) **Agent:** HARMAN, Michael, Godfrey; Hillgate Patent Services, N.6 Aztec Row, Berners Road, London N1 0PW (GB).

(81) Designated States (national): AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW.

(84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

[Continued on next page]

(54) Title: LOCKERS



(57) Abstract: A group of lockers or the like include at least a two neighbouring lockers; at least one locker includes a body forming a compartment having an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered. The door's curve remains lying upon the same circle during rotation. There is a cavity between the two lockers in question, which accommodates the door whilst it is in the closed position. The cavity is covered by a covering member. This covering member includes a recess to accept the one edge of the door of the second locker. The door of the locker is substantially outside the body of the locker when the locker is in the open position. The door is supported upon pivot means supplied by one or more generally segmental shapes pivoted about the apex of the segmental shape.

WO 01/13764 A1



Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Lockers

The present invention relates to lockers, that is, storage cubicles,
5 particularly, though not exclusively, arranged in rows.

A known type of locker comprises a cuboid body of five fixed panels which form two side walls, a back wall, a top and a bottom, and a hinged door which, when closed, forms the sixth face of the cuboid. The body and
10 door of the locker are conventionally made out of panels of sheet metal. Such lockers are commonly stacked side-by-side in rows, with the doors all similarly aligned and facing the same direction. Lockers are found in many public or semi-public environments for people to temporarily or indefinitely keep their belongings in. As their name implies, lockers also commonly
15 feature a locking means, typically a lock upon the door which engages with a keep formed in the body of the locker.

The door of such a locker is hinged using one or more hinge plates attached to the wall of the locker body and the door, the door being pivoted
20 about its vertical edge.

The hinge of the locker is vulnerable to many types of damage, such as people carelessly over-opening the door, so that the part of the door presses the edge of the side wall of the locker, whereupon the some part of
25 the hinge, or the door or body of the locker itself, may buckle and fail. Another type of strain put upon the locker hinges is caused by people who deliberately wish to cause damage to the locker by hanging upon the door, so that again the hinge or the door may become bucked or broken. The

locker is often targeted by thieves, who will apply force upon the key hole, or between the gap between the edge of the door and the locker walls.

The provision of such lockers in confined spaces, especially in narrow corridors, may also give rise to difficulties, as there must be enough space for the doors of the lockers to open whilst still allowing other people past the row of lockers.

US 5135293 and WO 8801143 both show a locker featuring a pivoted curved door, the pivoting point being inside the concavity of the curve. Whilst being opened, the door does not swing significantly towards the user of the locker, and the door is not as prone to damage as the cuboid locker.

The curved shape of the door used in these lockers result in some disadvantages over conventional lockers. When a curved door is fitted upon a generally cuboid locker, the curved door impinges upon the volume of the locker when the door is opened; this can be seen in the cuboid cubicles having curved doors shown in US 5651219. In a locker, this can result in the contents of the locker falling in the door's path when the locker is closed and jamming the door. Therefore, the shape of the body of the locker can be made to correspond to the curve of the locker, as in WO 8801143, and the bodies of the lockers arranged to attempt to waste as little space as possible, curved lockers being less efficient in that respect than cuboid lockers. US 5135293 attempts to minimise the problem of the contents of the locker barring the door's path by providing a door which is, when considered in cross section, approximately $\frac{3}{4}$ of a complete circle, and supplying shelves upon the door. There is though still a possibility that the

lockers contents could fall from the shelves and jam the locker; further, a large amount of space is wasted between the substantially cylindrical volumes which may be used for storage.

5 The object of the present invention is to provide a locker which is easy and efficient to manufacture, is spatially efficient, and alleviates other problems of the prior art lockers.

 According to the present invention there is provided a group of
10 lockers or the like, including at least first and second neighbouring lockers, at least the first locker including a body forming a compartment having an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being supported such that the door may be rotated from a closed position in which the open side
15 of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, there being a cavity between first and second lockers, the door's curve remains lying upon the same circle during rotation, and the cavity being capable of accommodating the door whilst it is in the closed position.

20

 Preferably the cavity, when considered from the front of the lockers, is covered by a covering member. Preferably the covering member includes a recess to accept the one edge of the door of the second locker.

25 According to another aspect of the invention, there is provided a locker or the like including a body forming a non-cylindrical compartment having an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being

supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, the door's curve remains lying upon the same circle during
5 rotation, the door being substantially outside the body of the locker when the locker is in the open position.

Preferably the door is supported upon pivot means. The pivot means may be supplied by one or more generally segmental shapes pivoted about the
10 apex of the segmental shape. Preferably a locking means to secure the door in the closed position acts upon the segmental shape. An extruded handle is provided on the door.

According to a further aspect of the invention, there is provided a
15 group of lockers according to any previous claim.

Preferably there is provided a cavity between the bodies of at least first and second neighbouring lockers capable of accommodating the door of the first locker whilst it is in the closed position. Preferably the cavity,
20 when considered from the front of the lockers, is covered by a covering member, which preferably includes a recess to accept the one edge of the door of the second locker.

It will be seen that a cuboid (or other non-cylindrical) volume may be
25 provided behind a curved door, with almost no danger of any contents of the locker falling in the path of the door so as to jam the locker.

A locker and group of lockers embodying the invention will now be described, by way of example, with reference to the drawings of which;

Figure 1 is a plan view of two lockers,

5

Figures 2a and 2b are a side elevation and front elevation respectively of the locker, and

Figure 3 is a plan view of a locker in more detail,

10

Figure 4 is a plan view of another embodiment of a locker and portions of neighbouring lockers.

Referring to figures 1, 2a and 2b, each locker 10 comprises a cuboid
15 body of five fixed planar rectangular surfaces which form two side walls 12,13, a back wall 15, a top 17 and a bottom 18, and curved door 20 of uniform cross section and curvature which is supported upon two hinge segments 25,26 which are pivoted about two pivot points on the body of the locker, an upper pivot point 28 on the locker's top, and a lower 29 on the
20 locker's bottom. Referring to figures 2a and 2b, the top of the locker includes two spaced panels 32,33 and the bottom of the locker includes a panel 35 spaced from a plinth 36 which rests upon the ground. Between the spaced panels 32,33, and the panel 35 and plinth 36, the upper and lower hinge segments 25,26 are respectively accommodated.

25

The pivot point 28,29 of each hinge segment 25,26 is located at the centre of a circle upon which the door's curve lies. Thus when the door 20 is pivoted about these pivot points, it remains lying upon this circle as it is

displaced. The pivot points, hinge segments and door are so arranged upon the body of the locker that the door may be swung between a closed position (as shown in the lower locker in figure 1) where it covers the open side of the locker and an open position where it permits full access to the open side of the locker (as shown in the upper locker in figure 1). The free edges of the side walls 12,13 of the locker (that is, two of the edges bounding the open side of the locker) lie somewhat inside the circle upon which the curve of the door 20 lies, and a chord joining the ends of the curve of the door is somewhat larger than the horizontal width of the open side. The door comes to a stop in its closed position when the side of the excised portion meets a buffer (not shown).

In order to open the door may be swung round about the pivot points, so that one edge of the door (that is, one end of the door's curve when considered in plan) comes to rest just before the side wall of the locker. For full access to the locker, the diameter of curvature of the door must be at least $1/\sqrt{2}$ the width of the locker, so that the door is not impeded by the side wall of the locker whilst the other side of the door continues to block the open side of the locker. The diameter of curvature should not be chosen to be any larger than is necessary to allow full access, since the extent to which the door extends to the side of the locker whilst being swung open should also be kept to a minimum.

The hinge segment 25 is a generally segmental shape, having a triangular portion 31 excised from one side. On the opposite side of the hinge segment a keep 33 is incorporated, the keep engaging with a lock 34 when the door 20 is its closed position. The hinge segment 25, and the weight of the door, are supported by a nylon glider 38 attached to the lower

surface of the upper segment 25, and which slides across the lower panel 33 of the two spaced panels which house the hinge segment. The lower hinge segment 26 may be similarly provided with a nylon glider beneath it.

5 The upper and lower hinge segments 25,26 also ensure that the locker compartment is completely enclosed, and for this reason the excised portion 30 of the hinge segment must not be such that it allows any substantial gap between the front edges of the top and bottom 17,18 of the locker on the one hand and the top and bottom edges of the door 20 on the
10 other. Alternatively, the top and bottom of the locker could be shaped so as to include a curved portion to cover these areas.

 The door also includes a handle 38 set upon the door's outer face (that is, its convex side), close to the trailing edge of the door (that is to say
15 it's the edge which trails hindmost along the door's curvature as the door is swung open). The handle is a shaped rib of constant cross section projecting perpendicularly from the door, and is conveniently an extruded plastics material. The handle runs vertically the whole height of the door, so that the door is convenient to open from a large range of heights. The door
20 and handle may be extruded as a single, integral piece.

 The lock 34 is operated by a proximity sensor upon the column member (which is described below). In use, keys operating such sensors (for example, by infra-red or ultrasound coded signals) may be kept by the
25 users of the lockers (where the users are to have long term use of the lockers) or may be lent on a short term basis to the users on payment of a deposit (for example, at a gymnasium). The proximity sensor is shielded so as to be protected against vandals or thieves. The lock and key is in any

case so configured that damage to the proximity sensor will not result in the lock being disengaged. The location of the lock, at the top of the locker beneath the upper panel of the locker top means that most opportunistic thieves will be dissuaded from attempting unauthorised entry of the locker.

- 5 The lock may be a mechanical lock, a motor driven bolt, or activated by a solenoid. A smart card could be used as a key, with a corresponding smartcard reader connected to the locker.

As shown in figure 1, a number of these lockers 10 are placed side by side in a row, set somewhat apart so that the each locker's door 20 may be accommodated in the space 21 between that locker and the neighbouring locker. A column member 40 is attached to one side of each locker to enclose the space between the lockers and its neighbour. The column member 40 presents a concave curve between a pair of lockers when one is considered as facing the lockers, and includes a vertical recess 42 to accommodate the trailing edge of the door of its own locker, and a gap 43 between itself and the next locker to permit that lockers door to swing past (these features being shown best in figure 3). The column member is of constant cross section.

20

The two lockers at the either end of the row are provided with column members of slightly different design, one column member requiring only the retaining groove 42 to accept the edge of the door, and the other column member requiring only the curved surface and gap 43 to cover the space occupied by the door in the open position. This space for the open door may be bounded by further panels, that is, a row end panel lying parallel to the lockers' side walls, and a panel extending in the same plane as the lockers' end panels. Alternatively, the lockers could be placed next

to one or more walls, the column member for the end locker being attached to the wall.

The column member includes the proximity sensor (not shown) by which the lock may be operated, and also an LED 45 embedded in the concavity of the column member which indicates when the lock is changing its state. The circuitry for the lock and sensor is located in the area bounded by the curved surface of the column member 40, a side wall 12 of one locker, and the curve of the door 20 (when in the closed position) of the neighbouring locker. This space, as well as other unutilised regions, such as the space bounded by the side wall of a locker and the curve of that same lockers door, and the remaining space between two side walls of neighbouring lockers, may be used to house other components, such as ventilation means (as described below), lighting means and the like.

15

On the side of the locker corresponding to the space where the open door is retained, the locker side has two excised regions 14 towards the front of the locker, these excised areas opening onto the regions between the locker top's spaced panels 32,33 and the locker bottom's plinth 36 and panel 35. These excised regions allow the top and bottom hinge segments 25,26 to swing over to the side of the locker as the door 20 is opened.

20

Along the back of the row of lockers, rear covering panels are attached to the locker backs, these panels lying in the plane of the lockers' backs, so as to cover the door retaining spaces when viewed facing the lockers' backs. Top covering panels lying in the plane of the lockers' tops similarly cover the door retaining spaces when viewed facing the lockers' tops. The rear covering panels and the panels making up the lockers' back

25

15 could be replaced by a single, integral panel. Similarly, the top covering panels and the upper panels 32 of the top spaced panels could be replaced by a single, integral panel.

5 It will be seen that in contrast to the lock, keep, and hinge of a prior art locker, the pivoting and locking means of the present locker are largely inaccessible, whether the door is opened or closed, thus cutting down the scope of damage which may be performed by vandals. Furthermore, no leverage can be brought to bear upon the door or the pivoting means.

10

The door of the present locker, in opening to one side of the compartment, allows lockers to be positioned in locations in which a locker having a conventionally pivoted door would be unacceptably cumbersome and restrictive.

15

Referring now to figure 4, in a modification of the locker the back of the locker 10' comprises two curved members 50,51 and a grating 53, each of which extend through the full height of the locker. The grating is planar rectangular shape, and lies perpendicular to the locker's side walls. Each curved member 50,51 includes retaining groove 55 which accepts the thickness of the sides walls so that each side wall 12,13 is joined to a curved member. The two curved members are similarly attached using grooves 56 to either side of the grate 53, securing it in place. The curved members thus, when considered in plan, 'round off' the rear corners of the previous embodiment of the locker 10.

20

25

A single, integral, panel 57 is erected to the rear of the row of lockers, so as to shield both the gratings 53 and the door retaining spaces

21'. The gratings 53 provide the lockers 10' with ventilation so that air in an individual locker does not become stale, as might occur for example when the locker is used to store clothes. The ventilation may be enhanced by providing a fan system associated with the row of lockers, the unannotated
5 arrows illustrating such a possible airflow.

Figures 2a and 2b also illustrates various components which may be included in the lockers, such as a grated towel shelf 60, a grated bag shelf 62, a glove box 64, and a coat hook 65. Naturally, many diverse elements
10 or accessories could be included in such a locker.

Many of the parts of the locker may conveniently be extruded, since they have a uniform cross section. As well as the simple planar rectangular top panels 32,33, bottom panel 35, back 15 and walls 12,13 of the locker 10, the door 20, handle 38, column member 40, and curved back portions 51 of
15 the embodiments shown herein could all be extruded, though naturally, they could be manufactured by other techniques.

Various materials could be used, most ideally for extrusion purposes
20 including plastic, laminated or otherwise toughened glass, and aluminium.

The dimensions of the locker will be dependent upon its intended use. For a locker for use in a gymnasium for example, the locker could be between about 250 mm to 400 mm wide, about 600 mm wide, and about 1.8
25 meters high. Smaller lockers, for example for person effects and stationary for use in schools and offices, overhead lockers in trains and planes, or for apartment letter boxes, could be of the order of 250 mm cubed. Lockers of

this size could be stacked one row on top of another. The lockers could of course be oriented so that the door pivots about a non-horizontal axis.

5 The same principle could also be applied to other types of compartment where a door is required with equal benefit, such as domestic cupboards and office filing cabinets, and even changing rooms and other cubicles.

CLAIMS

- 5 1. A group of lockers or the like, including at least first and second neighbouring lockers, at least the first locker including a body forming a compartment having an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being supported such that the door may be rotated from a closed position in
10 which the open side of the compartment is substantially covered by the door, to an open position in which the open side of the compartment is substantially uncovered, there being a cavity between first and second lockers, the door's curve remains lying upon the same circle during rotation, and the cavity being capable of accommodating the door whilst it is in the
15 closed position.
2. A group of lockers according to claim 1, wherein the cavity, when considered from the front of the lockers, is covered by a covering member.
- 20 3. A group of lockers according to either previous claim, wherein the covering member includes a recess to accept the one edge of the door of the second locker.
4. A locker or the like including a body forming a non-cylindrical
25 compartment having an open side, and a door of generally uniform cross section and of uniform curvature, this curvature lying upon a circle, the door being supported such that the door may be rotated from a closed position in which the open side of the compartment is substantially covered by the

door, to an open position in which the open side of the compartment is substantially uncovered, the door's curve remains lying upon the same circle during rotation, the door being substantially outside the body of the locker when the locker is in the open position.

5

5. A locker or the like according to claim 4, wherein the door is supported upon pivot means.

6. A locker or the like according to either of claims 4 or 5, wherein the pivot means is supplied by one or more generally segmental shapes pivoted about the apex of the segmental shape.

10

7. A locker or the like according to any of claim wherein there is included a locking means to secure the door in the closed position.

15

8. A locker or the like according to claim 7 wherein the locking means act upon the segmental shape.

9. A locker or the like according to any of claims 4 to 8 wherein an extruded handle is provided on the door.

20

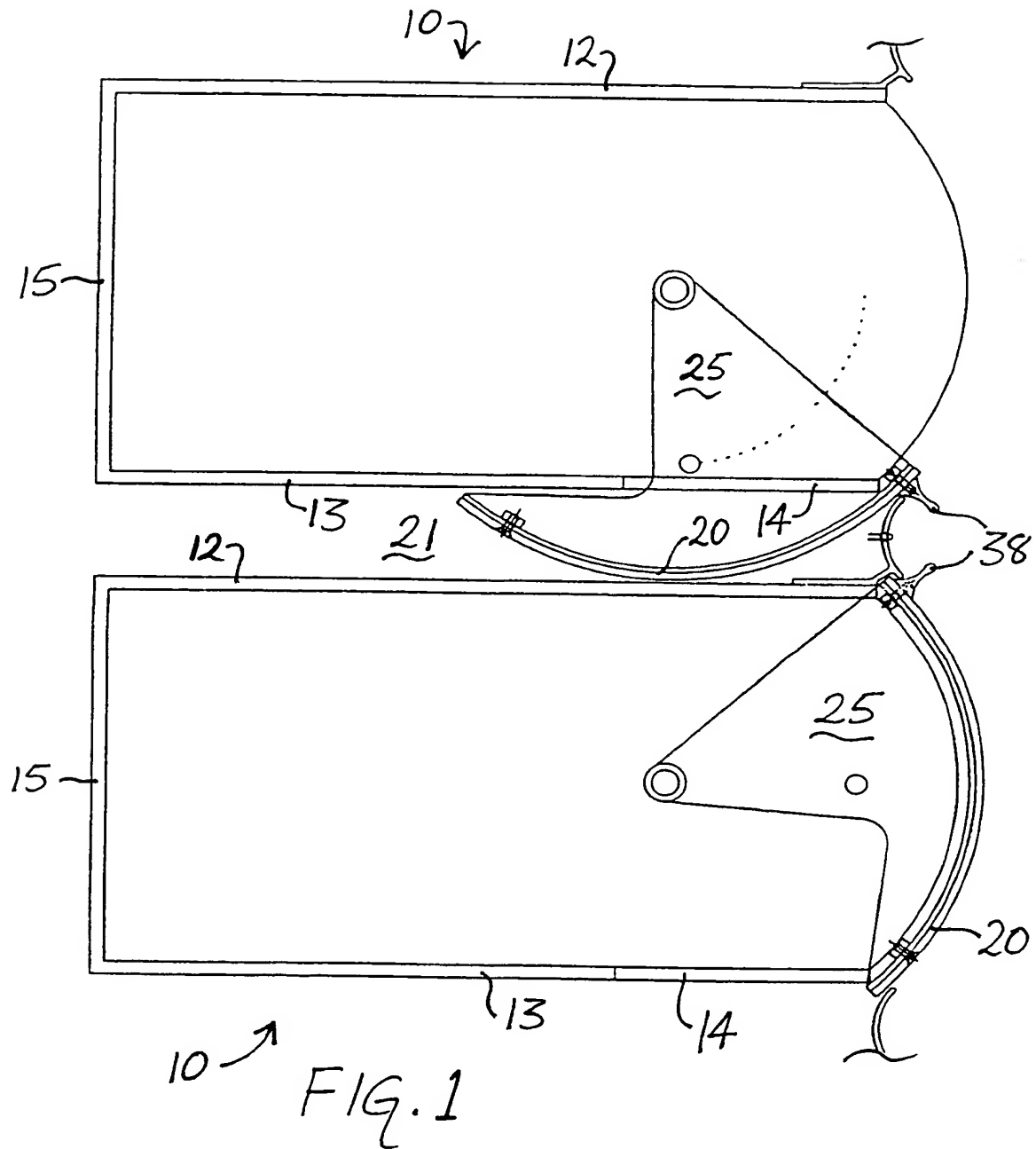
10. A group of lockers according to any of claims 4 to 9.

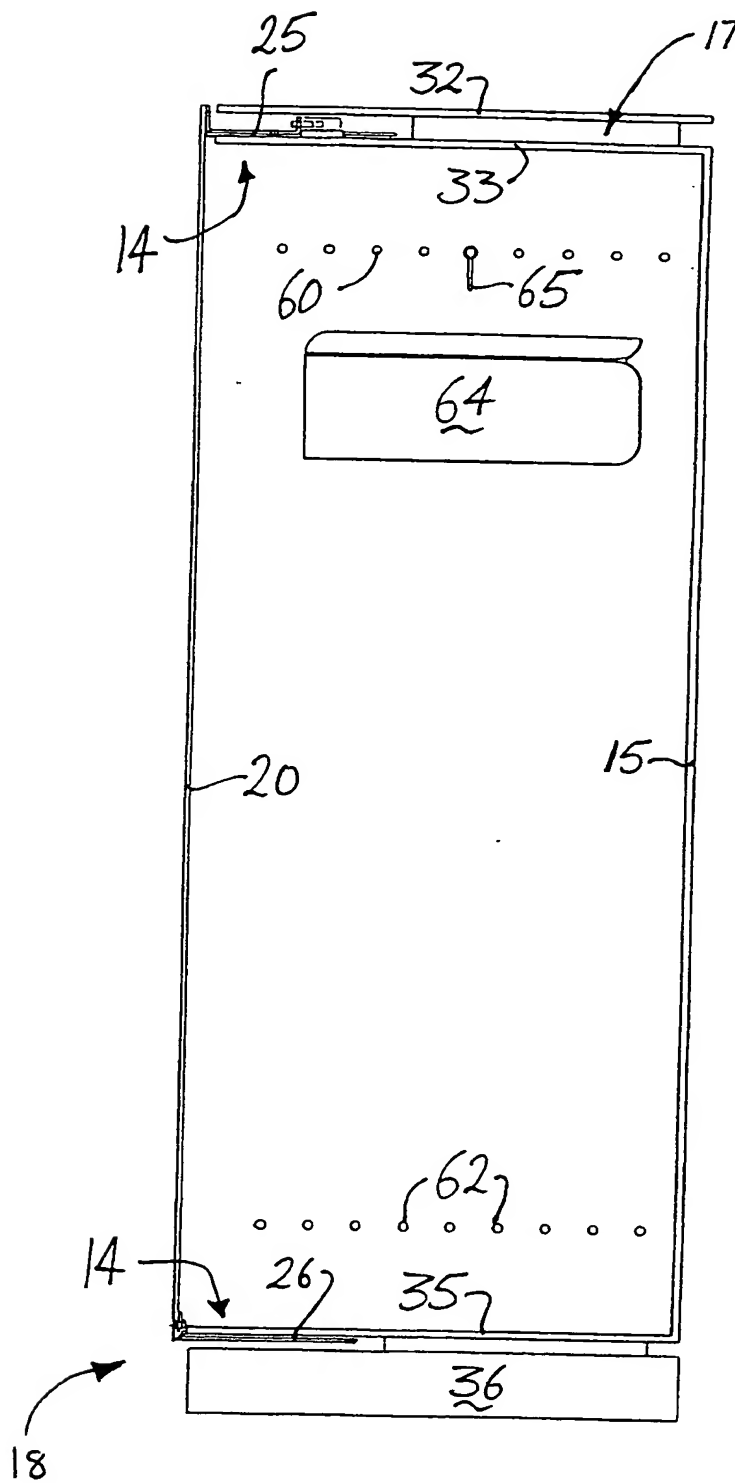
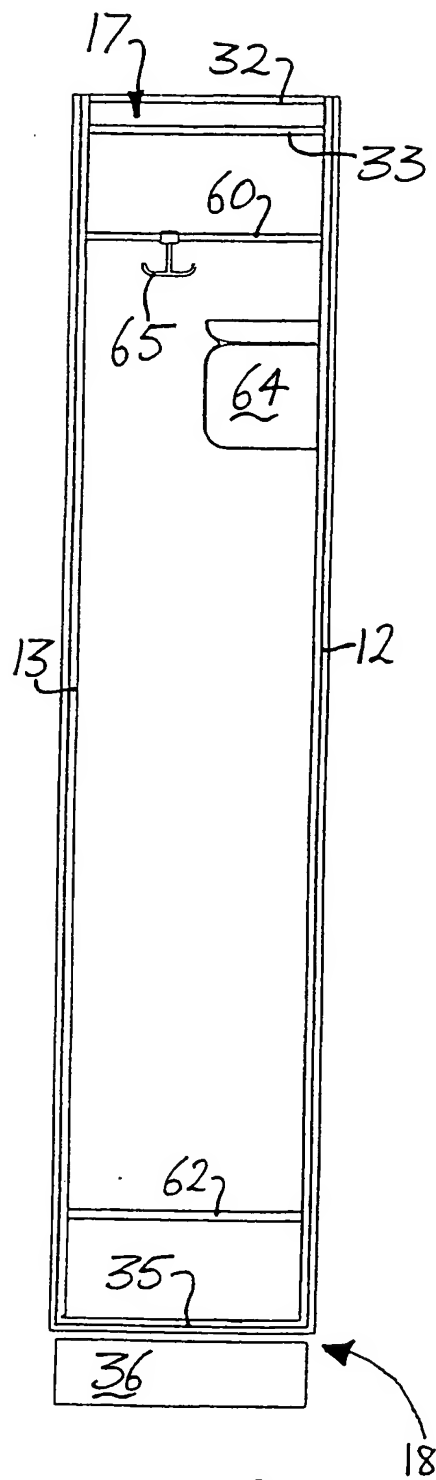
11. A locker or the like substantially as herein described and illustrated.

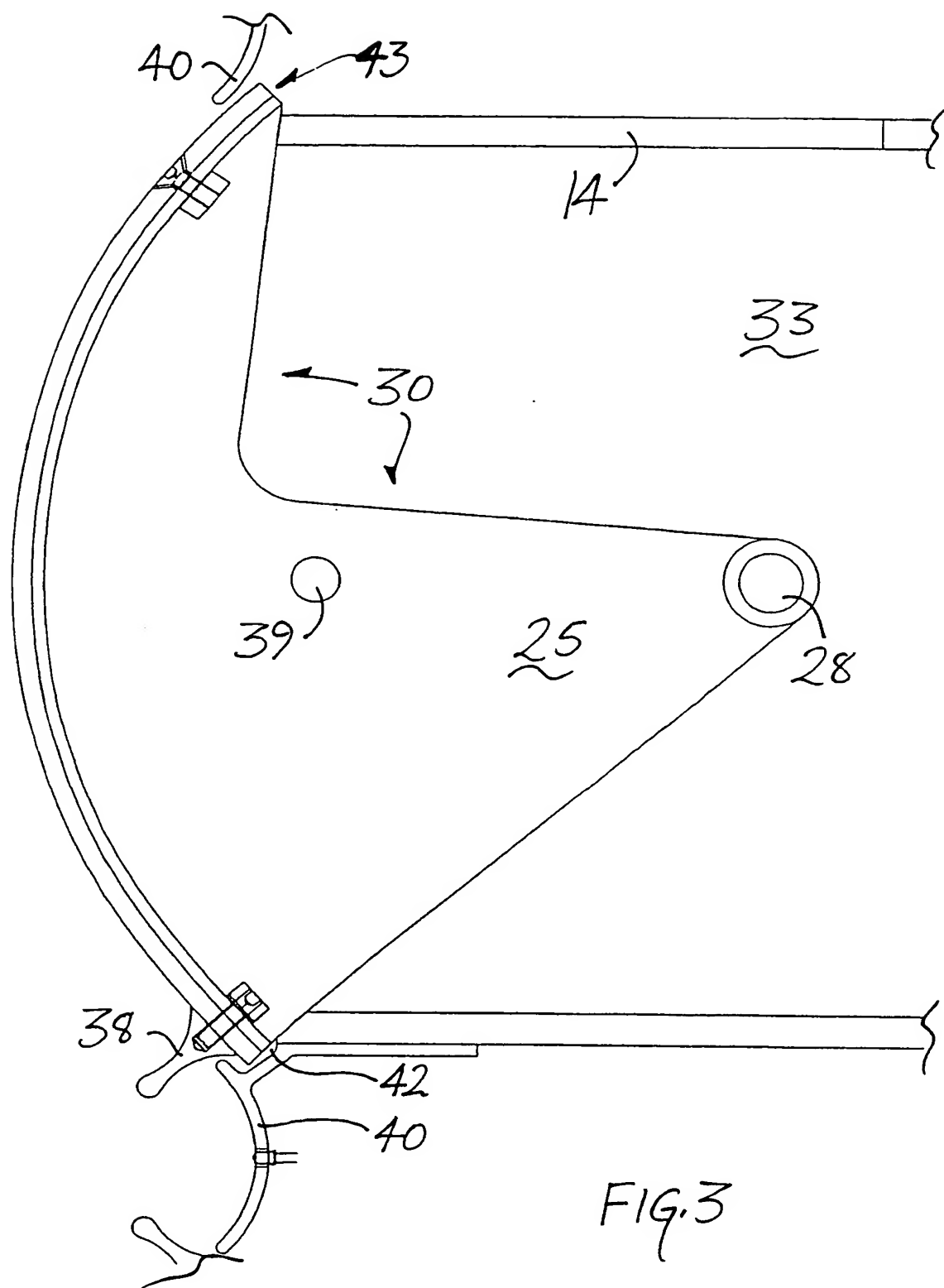
25

12. A group of lockers substantially as herein described and illustrated.

13. Any novel and inventive feature or combination of features specifically disclosed herein within the meaning of Article 4H of the International Convention (Paris Convention).







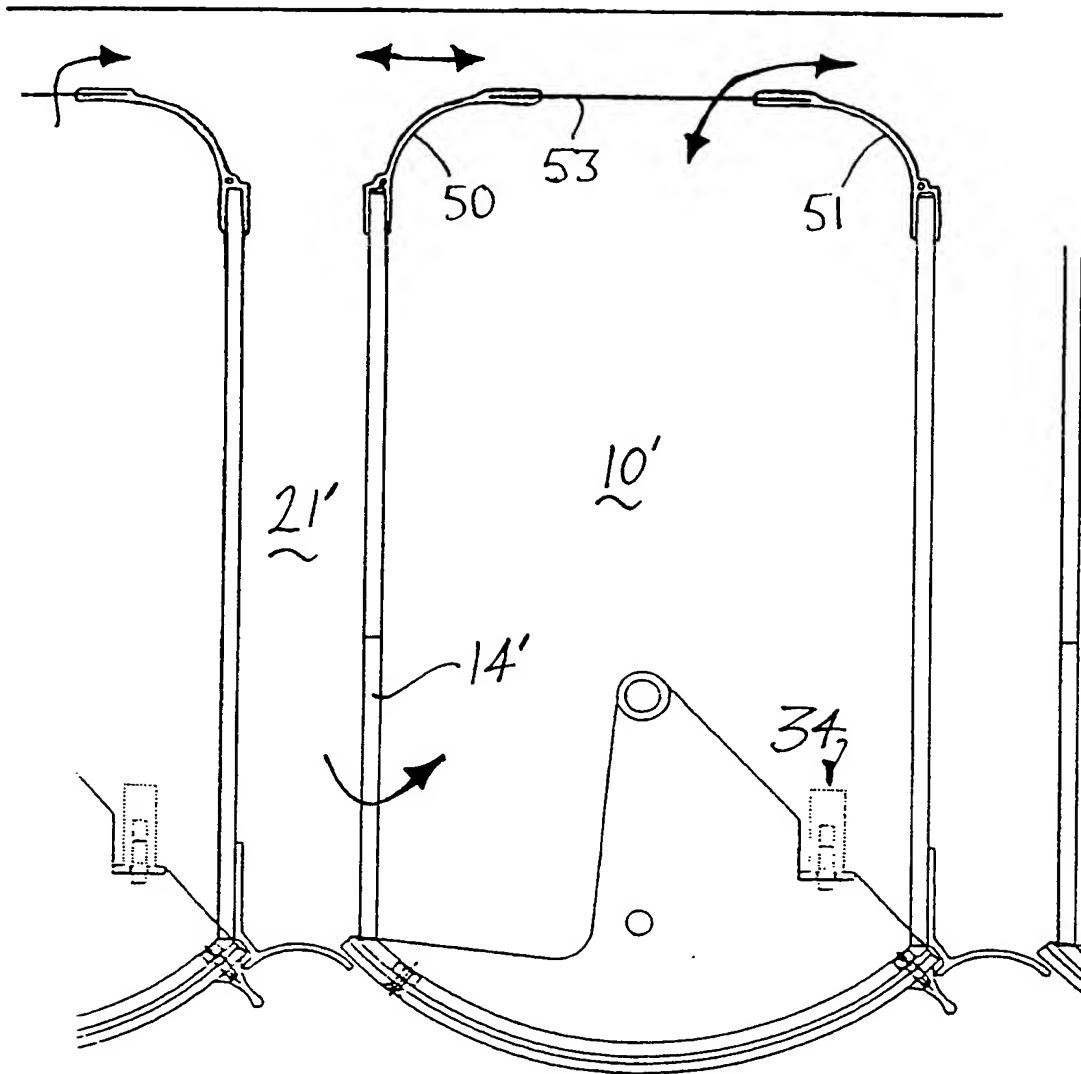


FIG.4

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IB 00/01135

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A47B61/00 A47B87/00 E06B3/90 E06B5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47B E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 783 132 A (BAUS HEINZ G) 8 November 1988 (1988-11-08)	4,5, 10-12
Y	abstract; figures 1,7	6,7
A	column 5, paragraph 2 ---	9
Y	FR 2 481 904 A (DAIGRE JEAN CLAUDE) 13 November 1981 (1981-11-13)	6
	claim 9; figures 1-3 ---	
Y	US 5 039 179 A (CHOUZENOUX GILBERT) 13 August 1991 (1991-08-13)	7
	cited in the application abstract; figures 1-5 column 2, line 13 - line 36 ---	
A	DE 360 666 C (MAASZ) 23 September 1919 (1919-09-23)	1,2
	claim 1; figures 1,2 ---	
	-/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

10 November 2000

Date of mailing of the international search report

17/11/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Jones, C

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 00/01135

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 651 219 A (ERIKSSON STEVEN W ET AL) 29 July 1997 (1997-07-29) cited in the application abstract; figures 1,2,7 column 6, last paragraph -column 7, paragraph 1</p> <p>-----</p>	1,2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB 00/01135

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4783132	A	08-11-1988	DE 3601614 A AT 66279 T AU 592273 B AU 6789287 A CA 1317627 A DE 3772060 A EP 0230237 A GR 3002719 T ZA 8700360 A	23-07-1987 15-08-1991 04-01-1990 23-07-1987 11-05-1993 19-09-1991 29-07-1987 25-01-1993 30-09-1987
FR 2481904	A	13-11-1981	NONE	
US 5039179	A	13-08-1991	FR 2602410 A AT 74723 T DE 3778371 A DE 3778371 D EP 0315639 A WO 8801143 A JP 7004303 B JP 2500332 T	12-02-1988 15-05-1992 21-05-1992 21-05-1992 17-05-1989 25-02-1988 25-01-1995 08-02-1990
DE 360666	C		NONE	
US 5651219	A	29-07-1997	US 5452547 A US 5687513 A	26-09-1995 18-11-1997